

CLINICAL VIGNETTE

A rare cause of ventricular fibrillation after atrioventricular node ablation: what is the mechanism?

Predrag Stojadinović, Petr Peichl, Dan Wichterle, Josef Kautzner

Institute for Clinical and Experimental Medicine, Prague, Czech Republic

A 65-year-old male patient with advanced heart failure due to a combination of dilated and ischaemic cardiomyopathy with left ventricular ejection fraction of 25%, left ventricular end-diastolic diameter of 85 mm, and left atrial volume index of 94.1 cm³/m², underwent implantation of a single-chamber cardioverter-defibrillator for primary prevention of sudden cardiac death. The patient presented with frequent episodes of acute decompensation due to atrial fibrillation (AF) with rapid ventricular response that was refractory to rhythm and rate control medication. Therefore, he was scheduled for an upgrade to a cardiac resynchronisation therapy device. Twenty-four hours after successful implantation of the device (Biotronic Iforia 3 HF-T, Berlin, Germany), atrioventricular (AV) node ablation was performed and pacing mode was set to VVIR, 85 bpm. On the same day, after ablation (specifically at 20:20), pace rate suddenly dropped to 50 bpm and this was not noticed by the ward staff. After 4 h polymorphic ventricular tachycardia was detected and was promptly terminated by internal defibrillator shock (Fig. 1). Device interrogation confirmed that the night mode at a pace rate of 50 bpm was switched on (factory setting). The algorithm activated itself earlier (standard activation time: 22:00) due to incorrect time settings of the device. After turning the night mode off, there were no adverse events during subsequent monitoring. The patient recovered quickly after the shock and was discharged in good condition the following day. His symptoms improved significantly due to adequate rate control. Pacemaker implantation followed by catheter ablation of atrioventricular junction is a well-established non-pharmacological alternative to rate control therapy in selected patients with AF. It is typically used in individuals who are severely symptomatic despite treatment with rate control drugs and/or rhythm control intervention. It is a relatively safe and technically simple procedure. Several studies and randomised trials have shown improvement in quality of life and left ventricular function in selected patients, especially those with biventricular pacing. Sudden cardiac death and ventricular tachycardia after AV node ablation are well-known complications. Sudden cardiac death was reported in 0.1% to 2% of cases, with the highest risk of occurrence within first two days after the procedure. It was originally thought that the substrate for ventricular arrhythmias is myocardial injury caused by direct current shock. Today, a substantial body of evidence suggests that post-ablation ventricular arrhythmias are associated with bradycardia-dependent increase in QT interval duration and transmural dispersion of repolarisation. These changes are known to promote early afterdepolarisation and triggered activity. For this reason, it is recommended to set the device to a higher pacing rate (80–90 bpm) after the AV node ablation. This case documents the importance of device programming after AV node ablation. It is recommended that a higher pacing rate (80–90 bpm) be set and the patient be monitored in hospital for at least 24 h. We showed that night rate mode can be harmful in such cases and should be always turned off.

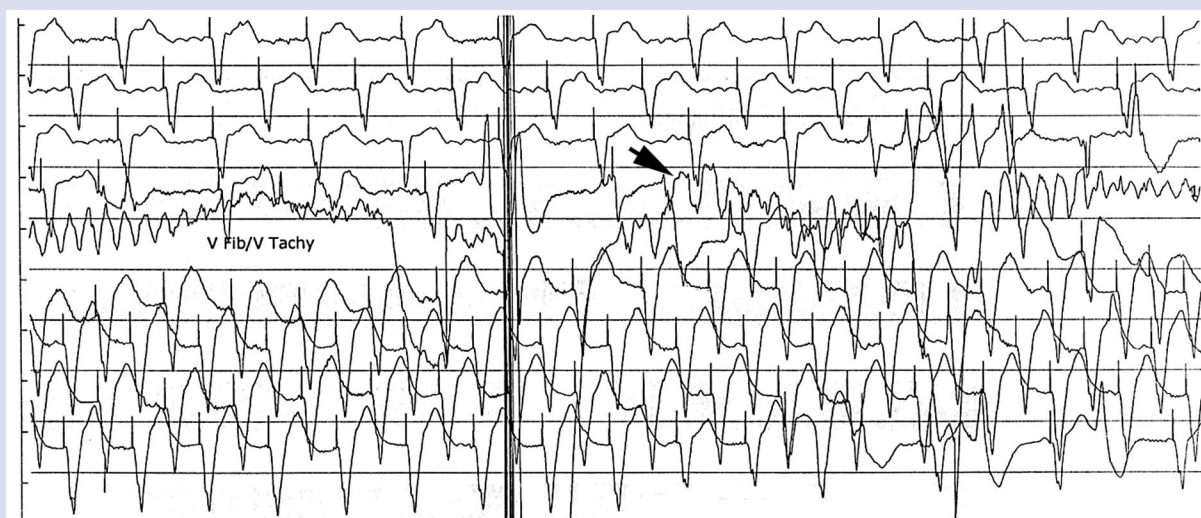


Figure 1. Monitor tracings

Address for correspondence:

Dr. Predrag Stojadinović, Institute for Clinical and Experimental Medicine, IKEM, Vídeňská 1958/9, 140 21 Praha 4, Prague, Czech Republic, e-mail: stop@ikem.cz

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